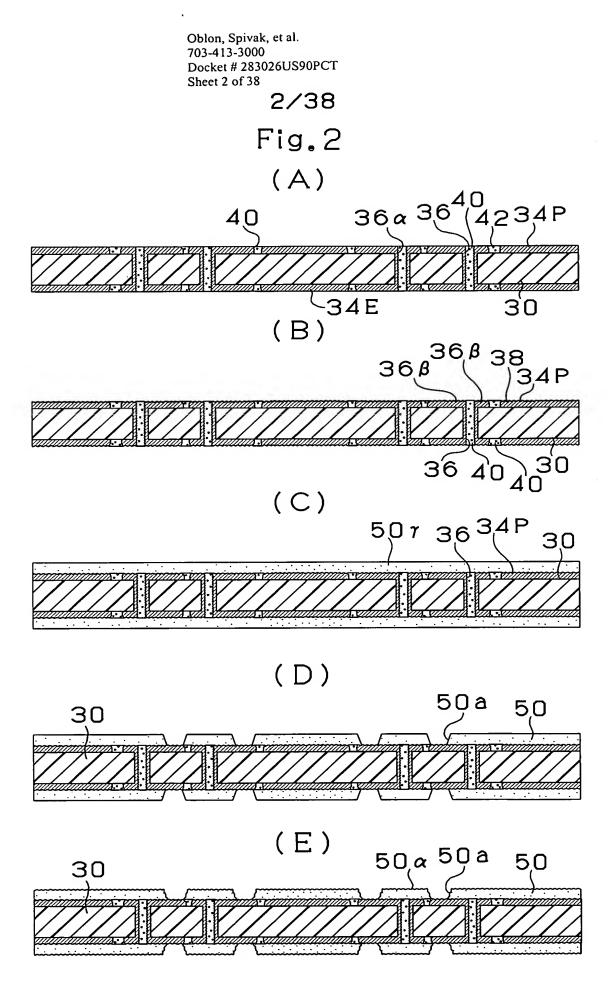
Oblon, Spivak, et al. 703-413-3000 Docket # 283026US90PCT Sheet 1 of 38 1/38 Fig. 1 (A) 3,2 3,0 (B) 34P 3,0 3,6 34E (C) 34α 36,a (D) 30



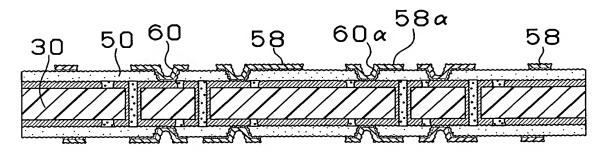
Oblon, Spivak, et al. 703-413-3000 Docket # 283026US90PCT Sheet 3 of 38 3/38 Fig. 3 (A) 5,2 _{5,0} 50,a 30 (B) 50 (C) 5,6 5,2 50 (D) 586,0 30 52,5,6 5,0 6,0

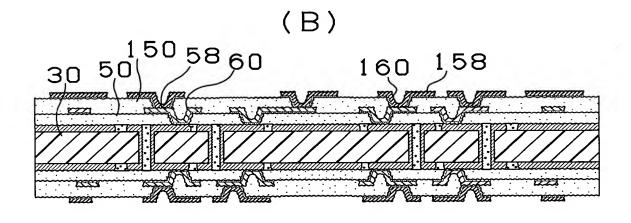
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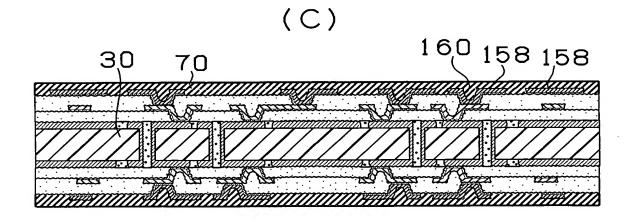
4/38

Fig. 4

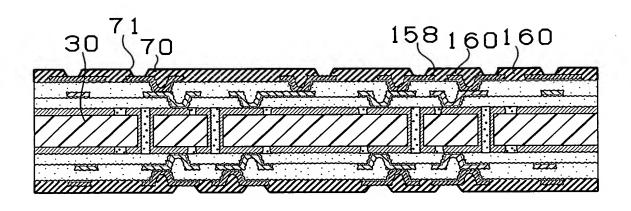
(A)



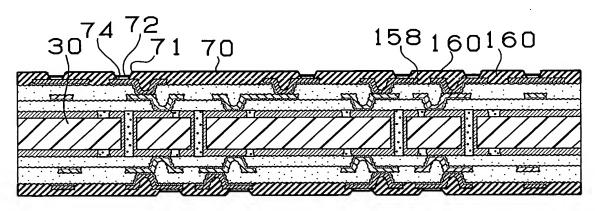


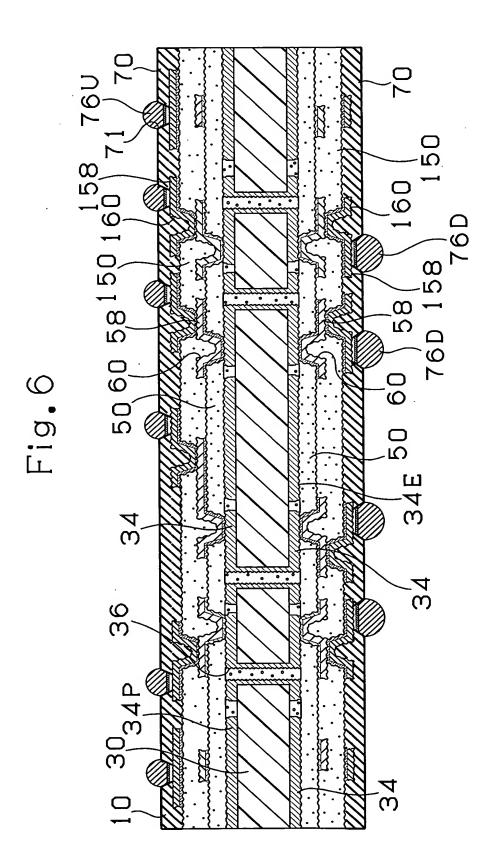


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Fig. 5
(A)

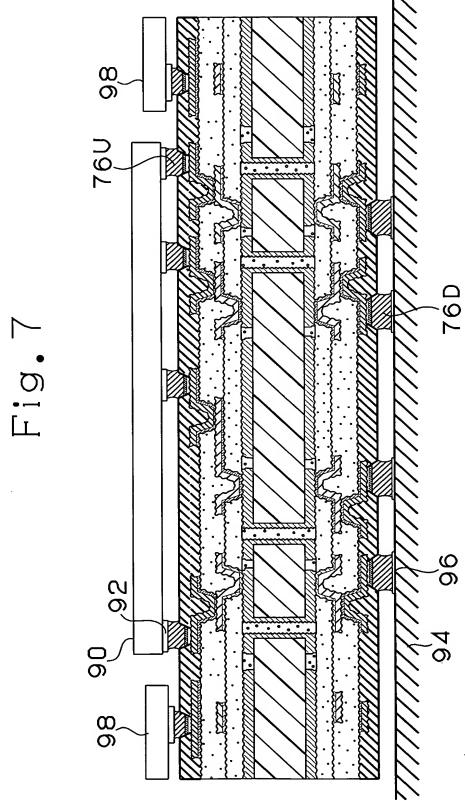


(B)



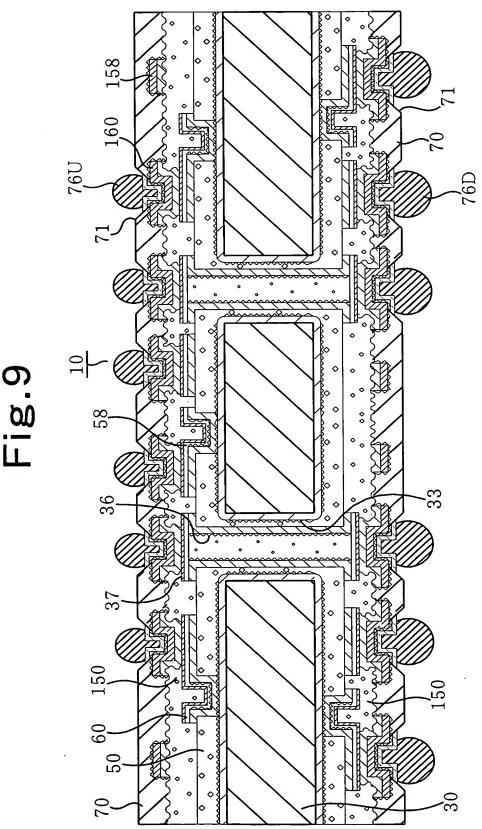


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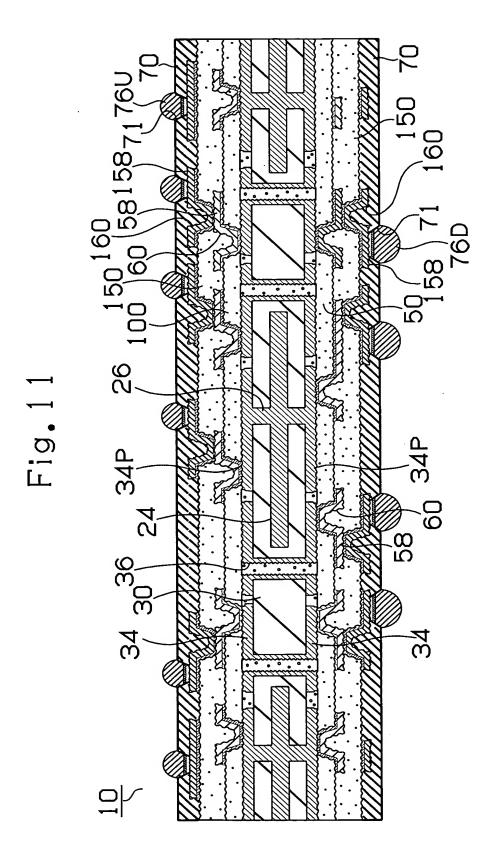


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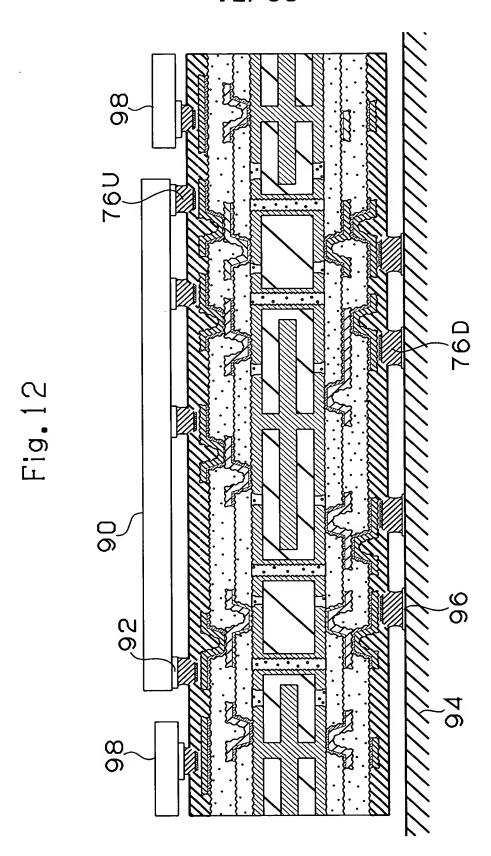
760 15815016017 60 1 0 587 34P 5 2 3 76D 0,0 00 (\text{\tint{\text{\text{\tint{\text{\text{\text{\text{\tint{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\tin}\text{\text{\text{\text{\text{\text{\text{\text{\text{\ti}\xi}\\\ \text{\ti}\}\\ \text{\tin}\text{\tex{\ti}\}\tittt{\text{\text{\text{\text{\text{\text{\text{\text{\ti}\text{\text{\text{\texi}\text{\text{\text{\texi}\text{\text{\texi}\text{\text{\texi}\text{\text{\text{\text{\text{\texi}\text{\texi}\text{\texi}\text{\text{\texi}\text{\text{\text{\text{\tex{ Fig. 8 (C)<u>ව</u> 50 34E 34 34 36 30 34P (B)



92 Fig.10



12/38



					14	14
Fig. 13	12 (A)	12a 12 (B)	12a 13 12 (C)	(D)	(E) 16	(F) 12 12
						16E
		ammunumuna				16

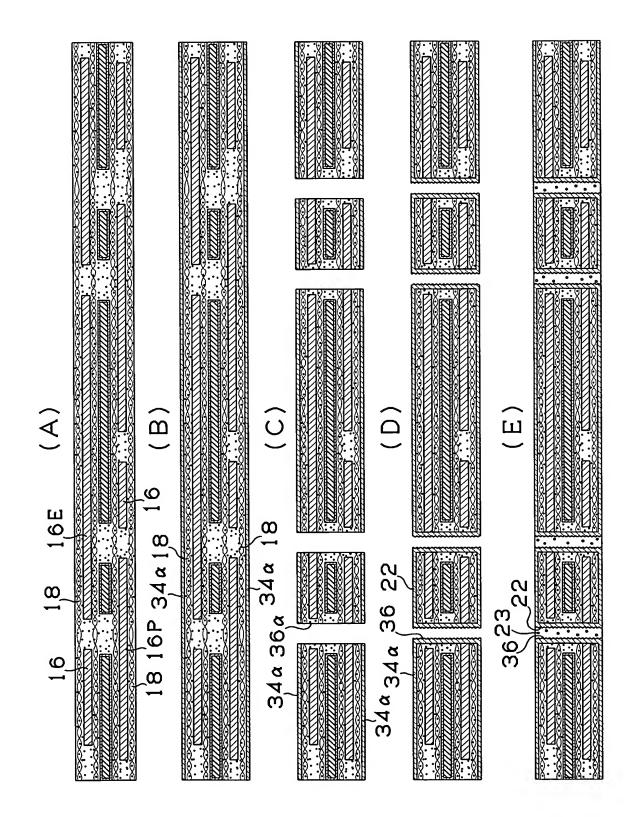
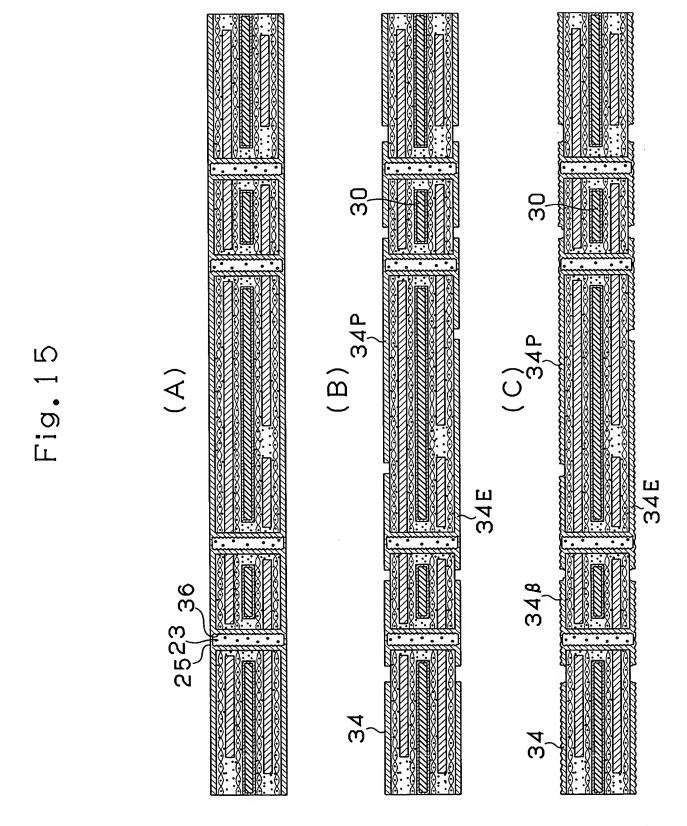
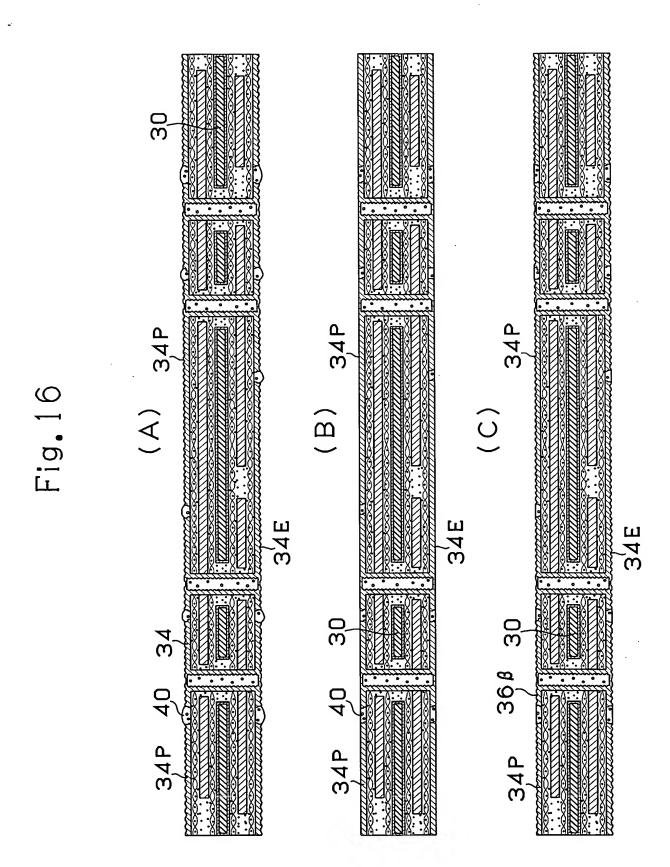
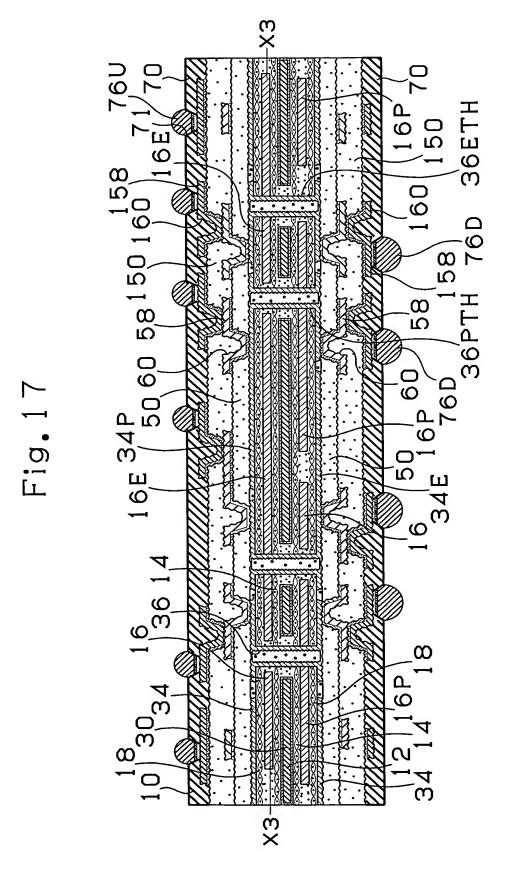


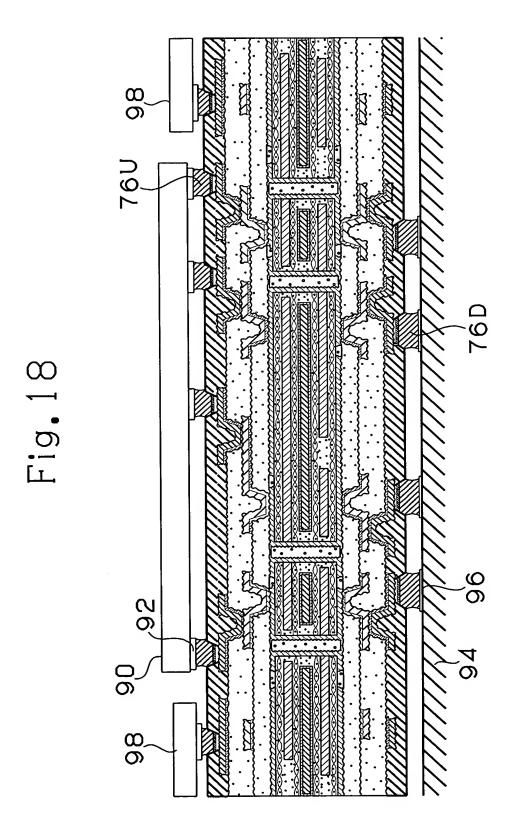
Fig. 14



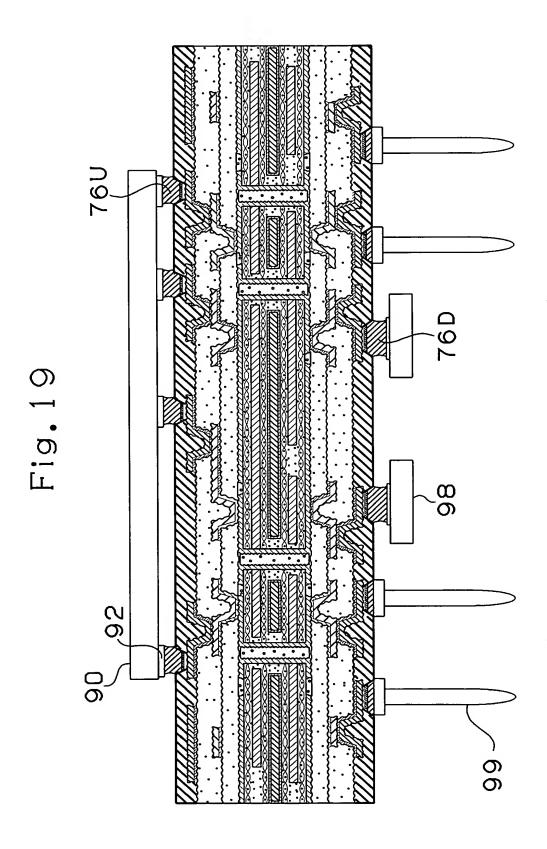




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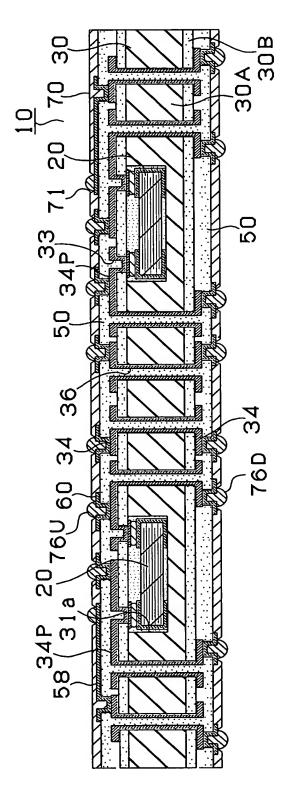
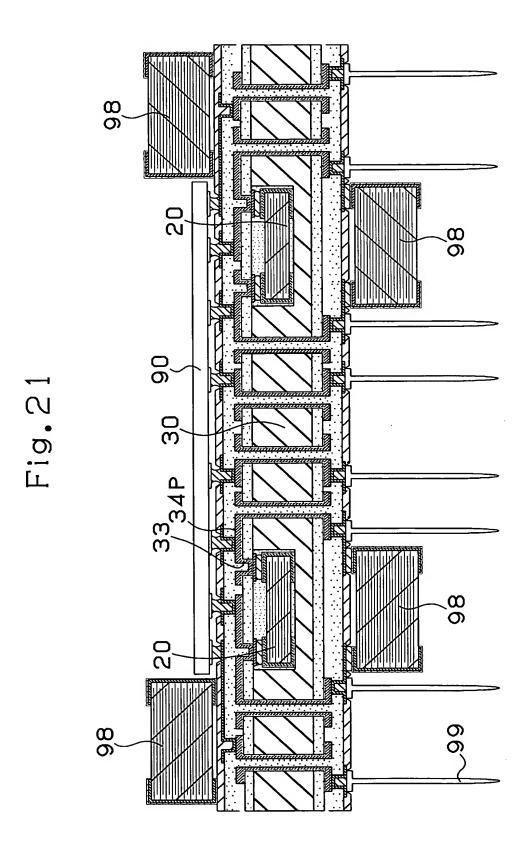


Fig. 20

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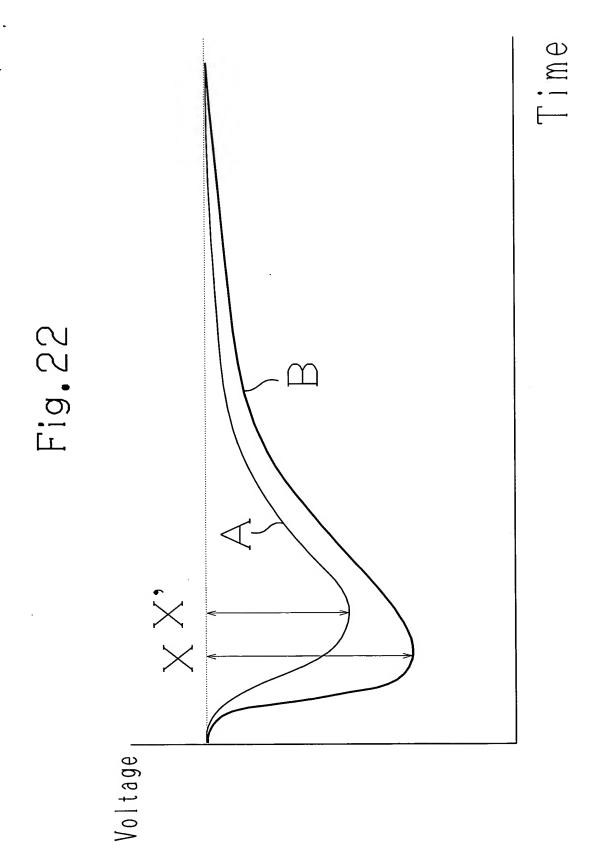
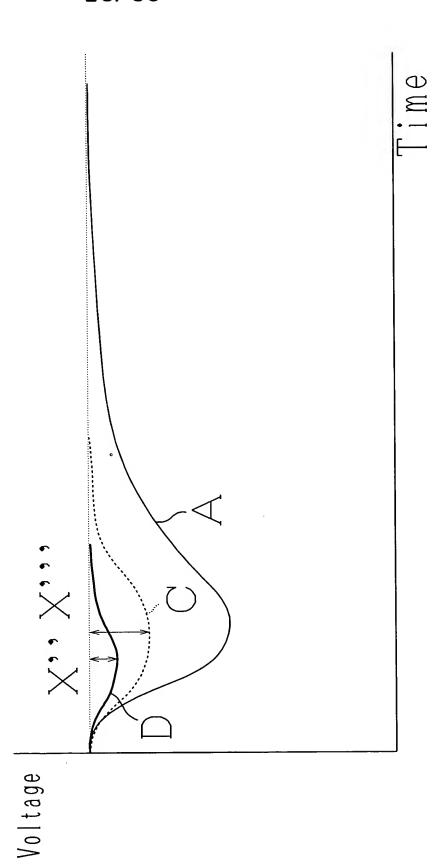
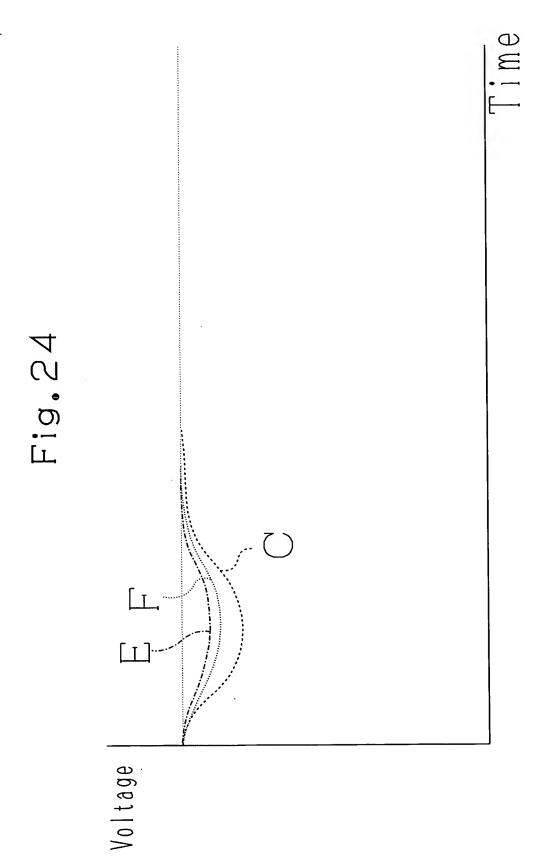


Fig. 23





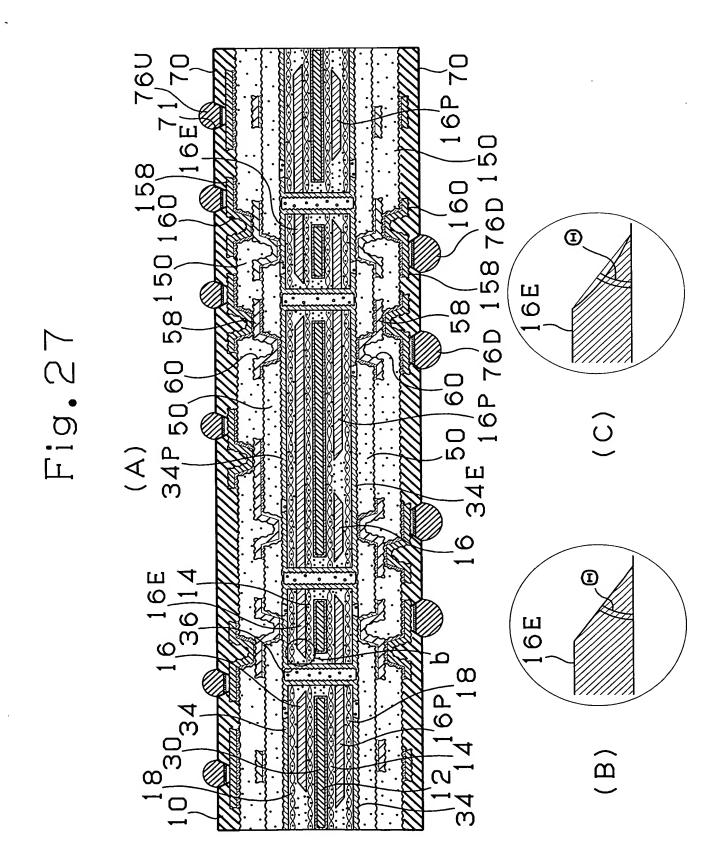
25
Fig.

	Thickness Of Conductor Circuit	100hr	hr	300hr	Jhr	500hr)hr	1000hr	Ohr	Amount Of Voltage Drop
	Ratio α1/α2	Presence /Absence Of IC Maffunction	Open Yes/No	Presence /Absence Of IC Malfunction	Open Yes/No	Presence /Absence Of IC Malfunction	Open Yes/No	Presence /Absence Of IC Malfunction	Open Yes/No	Voltage (V)
First Embodiment-1	20	0	0	0	0	0	0	0	0	0.091
First Embodiment -2	3.7	0	0	0	0	0	0	0	0	0.085
First Embodiment –3	5.0	0	0	0	0	0	0	0	0	0.085
First Embodiment -4	30.0	0	0	0	0	0	0	0	0	0.093
First Embodiment5	12	0	0	0	0	0	0	0	0	0.093
Second Embodiment -1	20	0	0	0	0	0	0	0	0	0.091
Second Embodiment -2	3.3	0	0	0	0	0	0	0	0	0.085
Second Embodiment -3	5.0	0	0	0	0	0	0	0	0	0.085
Second Embodiment -4	30.0	0	0	0	0	0	0	0	0	0.094
Third Embodiment -1	23	0	0	0	0	0	0	0	0	0.087
Third Embodiment -2	3.7	0	0	0	0	0	0	0	0	0.085
Third Embodiment -3	10.0	0	0	0	0	0	0	0	0	0.093
Third Embodiment -4	30:0	0	0	0	0	0	0	0	0	0.093
Third Embodiment5	40.0	0	0	0	0	0	0	0	0	960'0
Fourth Embodiment -1	3.3	0	0	0	0	0	0	0	0	0.085
Fourth Embodiment -2	4.0	0	0	0	0	0	0	0	0	0.085
Fourth Embodiment -3	5.0	0	0	0	0	0	0	0	0	0.085
Fourth Embodiment -4	20.0	0	0	0	0	0	0	0	0	960'0
Fourth Embodiment 5	30.0	0	0	0	0	0	0	0	0	0.097
Fourth Embodiment —6	40.0	0	0	0	0	0	0	0	0	8600

Fig. 26

	Thickness Of Conductor Circuit	100	0 0 h r	300hr	h r	500hr) h r	1000hr	0 h r	Amount Of Voltage Drop
	Ratio $\alpha 1/\alpha 2$	Presence /Absence Of IC Malfunction	Open Yes/No	Voltage (V)						
Fifth Embodiment -1	6.7	0	0	0	0	0	0	0	0	0.084
Fifth Embodiment -2	5.3	0	0	0	0	0	0	0	0	0.085
Fifth Embodiment -3	10.0	0	0	0	0	0	0	0	0	0000
Fifth Embodiment -4	20.0	0	0	0	0	0	0	0	0	0.094
Fifth Embodiment 5	30.0	0	0	0	0	0	0	0	0	0.095
Fifth Embodiment —6	40.0	0	0	0	0	0	0	0	0	0.097
Sixth Embodiment -1	20	0	0	0	0	0	0	0	0	0.091
Sixth Embodiment -2	3.7	0	0	0	0	0	0	0	0	0.085
Sixth Embodiment –3	5.0	0	0	0	0	0	0	0	0	0.085
Sixth Embodiment 4	30.0	0	0	0	0	0	0	0	0	0.095
Comparison Example -1	1.0	×	0	×	0	×	×	×	×	0.108
Comparison Example-2	1.0	×	0	×	0	×	×	×	×	0.108
Comparison Example-3	1:0	×	0	×	0	×	×	×	×	0.108
Comparison Example—4	1.0	×	0	×	0	×	×	×	×	0.108
Comparison Example—5	1.0	×	0	×	0	×	×	×	×	0.108
Reference Example-1	41.5	×	0	×	0	×	0	×	×	0.103
Reference Example-2	41.5	×	0	×	0	×	0	×	×	0.103
Reference Example-3	41.5	×	0	×	0	×	0	×	×	0.103
Reference Example-4	41.5	×	0	×	0	×	0	×	×	0.103
Reference Example-5	41.5	×	0	×	0	×	0	×	×	0.103

Presence/Absence Of Malfunciton Of IC Chip (O. No Malfunction, X. Malfunction) Open Yes/No (O. no open, X. open)



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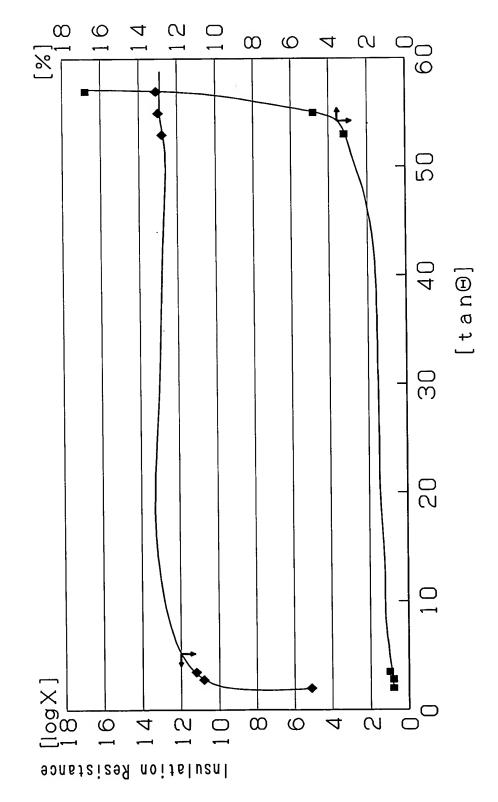
28/38 Fig. **28**

#	tanΘ	HAST(log X)	Resistance Cha nge Ratio (%)	Shape
Seventh	2	5. 1	0. 8	Rounded Face
Embodiment — 1		10.0	0.0	Rounded
Seventh	2. 8	10. 8	0. 8	Face
Embodiment-2				
Seventh	3. 5	11. 2	1. 0	Rounded
Embodiment-3				Face
Seventh	53	12. 8	3. 2	Rounded
Embodiment-4				Face
Seventh	55	13. 0	4. 8	Rounded
Embodiment-5				Face
Seventh	57	13. 1	16. 8	Rounded
Embodiment-6				Face
Seventh	2. 8	_	3. 4	Linear
Embodiment-7				
Seventh	53	-	5. 8	Linear
Embodiment-8				
Seventh	57	_	34. 2	Linear
Embodiment-9				

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Resistance Change Ratio



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Fig. 3(

														et 3					,,,		•																•	ers of core substrate.
	le Test		2000回									1									1	0	0	0		0	0	×	×	×	×	×	×					er source lay
	Heat Cycle Test		1000回																			0	0	0	0	0	0	0	0	0	0	0	0					um of powe
	Nalfunction		No.4							Yes	Yes	Yes	Yes	Yes	Yes	Yes	Se se	No	S S	% S	No Pi	Yes	2	2	2	2	<u>گ</u>	Yes	Yes	Yes	Yes	dicates a sı						
	Presence/Absence Of Malfunction		No.3	Yes	Yes	No	Yes	Yes	No	S S	No No	2	2	2	<u>ا</u>	S S	S S	S S	No	Yes	Yes	Yes	Yes	example in														
	ence/A		No.2	Yes	ဗို	No	No	No	No	No	No	S	No	S	Š	No	ž	% N	No	N _o	No	No	9	ဍ	೭	2	2	<u>گ</u>	2	٥	N	2	2	Yes	Yes	Yes	Yes	rative
	Pres		No.1	No	Ν̈́	No	No	No	No	No	No	Š	No	<u>گ</u>	٥	οN	ટ	ဍ	٥ N	٩ N	S.	No	$\overline{}$	\rightarrow	$\overline{}$	$\overline{}$	$\overline{}$		ટ	Š	N	શ	ટ	Yes	Yes	Yes	Yes	compa
			$tan \theta$	$1.6 \sim 2.5$	1.4~2.1	1.4~2.1	1.3~1.9	$1.3 \sim 1.9$	1.2~1.7	$3.0 \sim 10.8$	$3.0 \sim 11.0$	$3.0 \sim 11.2$	$2.8 \sim 11.2$	$2.7 \sim 11.0$	$2.7 \sim 11.4$	$3.0 \sim 5.3$	≀	$3.1 \sim 5.4$	$2.7 \sim 5.5$	2.9~5.7	2.7~5.7	$4.2 \sim 10.8$	4.0~11.0	7	$3.7 \sim 11.2$	$3.7 \sim 11.4$	$3.7 \sim 11.3$	4.0~10.8	$4.0 \sim 10.8$	$4.0 \sim 11.0$	$3.7 \sim 11.2$	$3.8 \sim 11.4$	$3.7 \sim 11.4$	$1.6 \sim 2.5$	$3.0 \sim 10.8$	$3.0 \sim 5.3$	$4.2 \sim 10.8$	he eighth
18.00		Shape Of	Taper	30 Rounded Face	45 Rounded Face	60 Rounded Face	100 Rounded Face	H	150 Rounded Face	Face	Face				150 Rounded Face	30 Rounded Face			100 Rounded Face				45 Rounded Face	60 Rounded Face		Face	一						150 Linear	Rounded Face	Face	Face	Rounded Face	in inner layer of t
		Thickness Of Conductive Layer	In Inner Layer	30	45	09	100	125	150	30	45	09	100	125	150	30	45	09	100	125	150	30	45	90	100	125	150	30	45	09	100	125	150		*		*	ess of conductor
		<u> </u>				-	-	-	-	-						-				-					H									15*	2 15*	Т	15*	thickn
		T.	Embodiment	Eighth Embodiment-1	Eighth Embodiment-2	Eighth Embodiment-3	Eighth Embodiment-4	Eighth Embodiment-5	Fighth Embodiment-6	Eighth Embodiment-7	Eighth Embodiment-8	Eighth Embodiment-9	Eighth Embodiment-10	Eighth Embodiment-11	Eighth Embodiment-12	Eighth Embodiment-13	Eighth Embodiment-14	Eighth Embodiment-15	Eighth Embodiment-16	Eighth Embodiment-17	Eighth Embodiment-18	Eighth Embodiment-19	Eighth Embodiment-20	Eighth Embodiment-21	Eighth Embodiment-22	Eighth Embodiment-23	Eighth Embodiment-24	Eighth Embodiment-25	Eighth Embodiment-26	Eighth Embodiment-27	Eighth Embodiment-28	Eighth Embodiment-29	Eighth Embodiment-30	Eighth Comparison Example-1	Eighth Comparison Example-2	Eighth Comparison Example-3	Eighth Comparison Example-4	A value marked in column of thickness of conductor in inner layer of the eighth comparative example indicates a sum of power source layers of core substrate.

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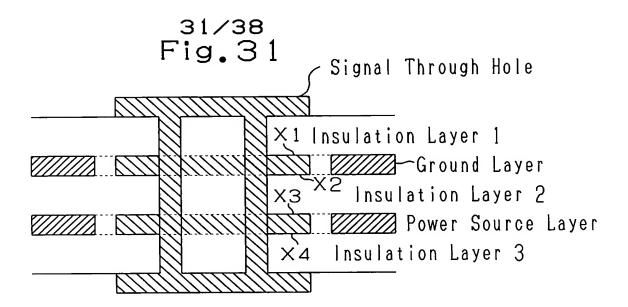


Fig. 32

#	α1/ α2	Quantity Of Inner Layers	Thickness Of Conductive Layer On Interlayer Insulation Layer (µm)	Thickness Of Power Source Layer On The Front Surface Of Core Substrate (µm)	Thickness Of Power Source Layer In Inner Layer Of Core Substrate (µm)	Sum Of Thicknesses Of Power Source Layers Of Core (µm)	Amount Of Voltage Drop (V)	Result After HAST Test
Ninth Embodiment—1	2	2	20	15	25	40	0.091	0
Ninth Embodiment—2	1.2	2	20	6	15	24	0.093	0
Ninth Embodiment—3	3	2	20	15	45	09	0.085	0
Ninth Embodiment—4	3.75	2	20	15	09	75	0.085	0
Ninth Embodiment—5	30.75	12	20	15	100	615	0.095	0
Ninth Embodiment—6	40.75	16	20	15	100	815	0.097	0
Ninth Embodiment—7	3	2	20	45	15	09	0.087	0
Ninth Embodiment—8	3.75	2	20	09	15	75	980'0	0
Ninth Embodiment — 9	3.25	2	20	15	50	65	0.084	0
Ninth Embodiment — 10	8.25	2	20	15	150	165	0.083	0
Ninth Embodiment — 11	9.5	2	20	15	175	190	60.0	×
Ninth Embodiment — 12	10.75	2	20	15	200	215	0.093	×
Ninth Embodiment—28	7	2	20	15	125	140	0.084	0
Ninth Comparison Example — 1	_	2	20	01	10	20	0.108	0
Ninth Comparison Example — 2	42	16	20	40	100	840	0.103	0
Ninth Comparison Example — 3	50.75	20	20	15	100	1015	0.123	0

Fig. 33

	α 1 /	Quantity	Thickness	Thickness Of	Thickness Of	Sum Of	Amount	Presence/	Presence/Absence Of Malfunction	laffunction
	α2	Of Inner	ъ	Power Source	Power Source	Thicknesses	ъ	Mounting	Mounting	Mounting
		Layers	Conductive	Layer On The	Layer In Inner	Of Power	Voltage	of No 1 IC	of No 1C	of No.3 IC
			Layer On	Front Surface	Layer Of Core	Source Layers	Drop	2		
			Interlayer	Of Core	Substrate (µm)	Of Core	S			
			Insulation	Substrate		(mn)				
			Layer (µm)	(mm)						
Ninth Embodiment — 1	2	2	20	15	25	40	0.091	2	Yes	Yes
Ninth Embodiment—2	1.2	2	20	6	15	24	0.093	2	Yes	Yes
Ninth Embodiment — 3	က	2	20	15	45	09	0.085	№	2	2
Ninth Embodiment—4	3.75	2	20	15	09	75	0.085	2	2	8
Ninth Embodiment—5	30.75	12	20	15	100	615	0.095	2	Yes	Yes
Ninth Embodiment —6	40.75	16	20	15	100	815	0.097	&	Yes	Yes
Ninth Embodiment—7	က	2	20	45	15	09	0.087	2	2	Yes
Ninth Embodiment—8	3.75	2	20	99	15	75	980:0	2	2	Yes
Ninth Embodiment—9	3.25	2	20	15	20	65	0.084	2	2	%
Ninth Embodiment — 10	8.25	2	20	15	150	165	0.083	2	2	Yes
Ninth Embodiment—11	9.5	2	8	15	175	190	60.0	&	Yes	Yes
Ninth Embodiment—12	10.75	2	20	15	200	215	0.093	2	Yes	Yes
Ninth Embodiment—27	4	4	20	15	32.5	80	0.087	2	2	Yes
Ninth Embodiment—28	7	2	20	15	125	140	0.084	2	2	2
Ninth Comparison Example — 1	-	2	50	10	10	20	0.108	Yes	Yes	Yes
Ninth Comparison Example — 2	45	16	20	40	100	840	0.103	Yes	Yes	Yes
Ninth Comparison Example — 3	50.75	20	20	15	100	1015	0.123	Yes	Yes	Yes

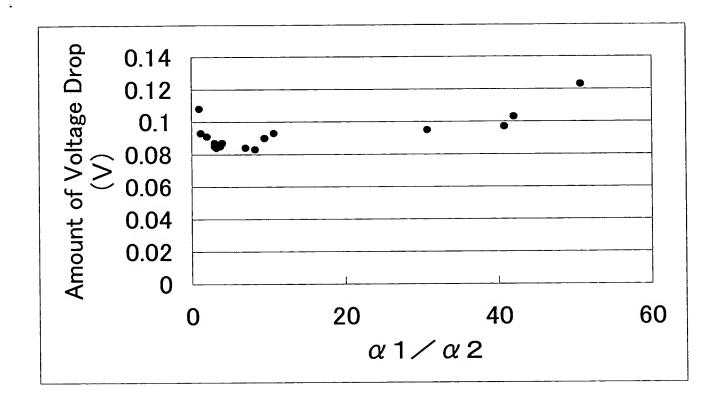
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Fig. 34

	Co	onductor Width/	interval Betwe	en Conductors (μι	n)
#	5/5	7. 5/7. 5		12. 5/12. 5	15/15
Ninth Embodiment-3	0	0	0	0	0
Ninth Embodiment-4	0	0	0	0	0
Ninth Embodiment-7	×	×	0	0	0
Ninth Embodiment-8	×	×	0	0	0

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35/38 Fig. 35



				lhickness	Thickness	Thickness	Sum Ot	Presence/,	Presence/Absence Of Malfunction	falfunction
				: ზ (Of Power	Of Power	Thicknesses -	Mounting	Mounting	Mounting
	۵1	2		Conductive	Source Paver On	Source	Of Power	of No.1 IC	of No.2 IC	of No.3 IC
#		dummy		Interlayer	The Front	Inner Laver	Lavers Of			÷
		land Tuok	Inner	Insulation	Surface Of	Of Core	Core			
		, , ,	e de la composition della comp	Layer	Core	Substrate	(mn)			
				(mn)	Substrate (µm)	(mm)				
Ninth Embodiment—13	က	22	2	20	15	45	09	No	No	No
Ninth Embodiment—14	က	91	2	8	15	45	09	No	No	No
\vdash	3.25	20	2	20	15	20	65	2	Š	No
-	3.25	100	2	20	15	20	65	Š	2	No
Ninth Embodiment—17	3.75	20	2	20	15	90	75	2	2	2
-	3.75	9	2	20	15	09	75	2	8	2
-	8.25	20	2	8	15	150	165	8	S _e	8
	8.25	100	2	20	15	150	165	2	S _O	2
Ninth Embodiment—21	9.5	20	2	20	15	175	190	%	No	Yes
Ninth Embodiment—22	9.5	9	2	20	15	175	190	S	No	Yes
	10.75	20	2	20	15	200	215	S.	No	Yes
╁	10.75	100	2	20	15	200	215	No	No	Yes
Ninth Embodiment—25	က	20	2	20	45	15	09	8	8	Yes
Ninth Embodiment — 26	က	100	2	20	45	15	90	No	No	Yes

Fig. 36

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Embodiment	Thickness Of Conductive Layer In Inner Layer	Shape Of Taper	au tan $ heta$	no-dummy land TH%	Presence/Absence Of Malfunction No.4
Tenth Embodiment-1	45	Rounded Face	3.1~5.4	50	No
Tenth Embodiment-2	60	Rounded Face	3.1 ~ 5.4	50	No
Tenth Embodiment-3	100	Rounded Face	2.7~5.5	50	No
Tenth Embodiment-4	125	Rounded Face	2.7 ~ 5.7	50	No
Tenth Embodiment-5	150	Rounded Face	2.9~5.7	50	No
Tenth Embodiment-6	45	Rounded Face	3.1~5.4	100	No
Tenth Embodiment-7	60	Rounded Face	3.1~5.4	100	No
Tenth Embodiment-8	100	Rounded Face	2.7~5.5	100	No
Tenth Embodiment-9	125	Rounded Face	2.7~5.7	100	No
Tenth Embodiment-10	150	Rounded Face	2.9~5.7	100	No
Tenth Embodiment-11	45	Rounded Face	4.0~11.0	50	No
Tenth Embodiment-12	60	Rounded Face	3.8~11.0	50	No
Tenth Embodiment-13	100	Rounded Face	3.7~11.2	50	No
Tenth Embodiment-14	125	Rounded Face	3.7~11.4	50	No
Tenth Embodiment-15	150	Rounded Face	3.7~11.3	50	No
Tenth Embodiment-16	45	Rounded Face	4.0~11.0	100	No
Tenth Embodiment-17	60	Rounded Face	3.8~11.0	100	No
Tenth Embodiment-18	100	Rounded Face	3.7~11.2	100	No
Tenth Embodiment-19	125	Rounded Face	3.7~11.4	100	No
Tenth Embodiment-20	150	Rounded Face	3.7~11.3	100	No

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Fig.38

